

Connecting the Dots Between Housing and Health

David E. Jacobs, PhD, CIH
U.S. Department of Housing and
Urban Development

Children's Environmental Health Regional Summit Conference
Salt Lake City, UT

October 8, 2004



Substandard Housing Is:

- Unhealthy
- Not Sustainable
- Not Affordable



Florence Nightingale

“The connection between health and the dwelling of the population is one of the most important that exists.”

Cited in Lowry, S, BMJ, 1991, 303, 838-840



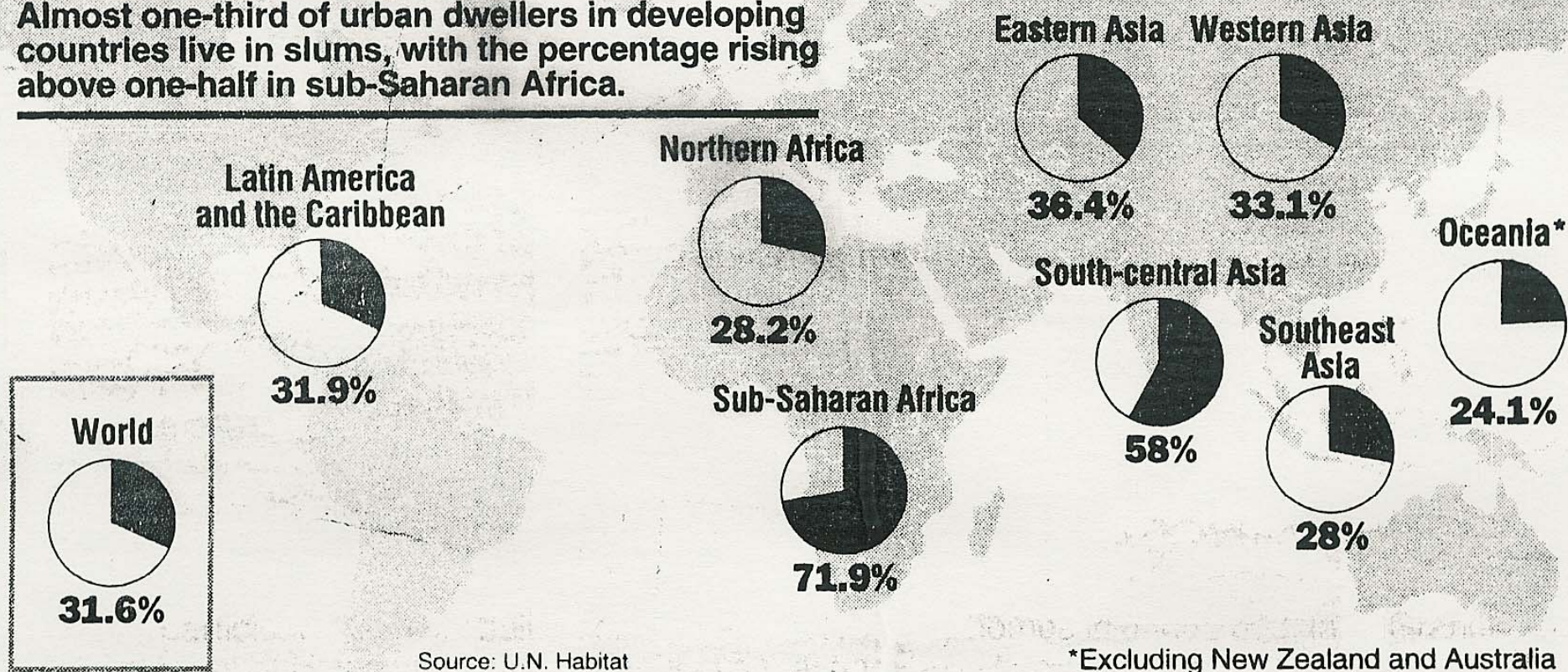
Health in the Late 19th Century

- Challenge of Tuberculosis Seemed Insurmountable
- Lessons for Public Health Officials, Architects and Planners: Light, Fresh Air, Reduce Crowding.
- With Improved Living Conditions, Disease Rates Declined



URBAN MISERY

Almost one-third of urban dwellers in developing countries live in slums, with the percentage rising above one-half in sub-Saharan Africa.



Source: U.N. Habitat

*Excluding New Zealand and Australia

The Washington Times



BRIEFING/GLOBAL ISSUES

Decent housing is global goal

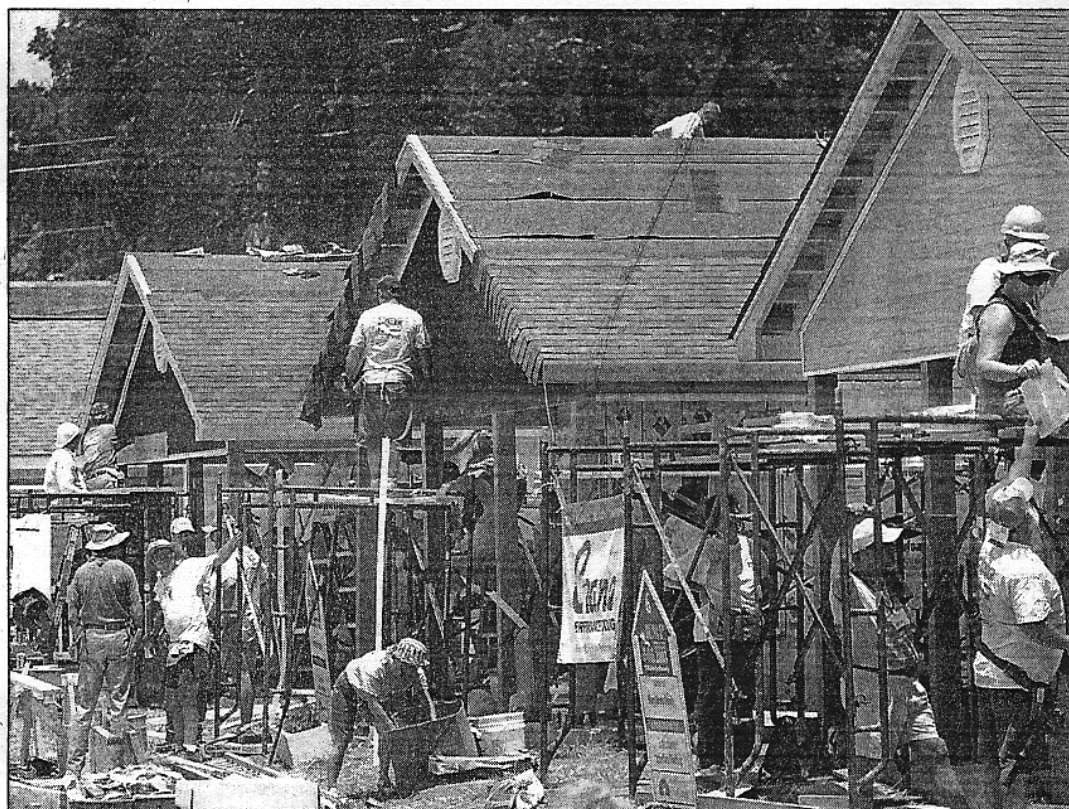
U.N. agency partners with Habitat group

By Marion Baillot
THE WASHINGTON TIMES

Between soaring interest rates and a monthly income of less than \$200, the only shelter the Verduguez family could afford in Cochabamba, Bolivia, was two tiny rooms in a run-down adobe-block house.

The walls are cracked, the stucco is falling and water leaks through the roof when it rains. Romulo, 45, and Adela, 41, struggle to find enough room for their six children, ages 3 to 21, to sleep.

"With no bathroom in the house, our family has to go down the street to public toilets and showers shared by 80 other people. Everybody pays 32 cents each time to use the facilities. Water from the public system is available only once a week," said Mr. Romulo.



Volunteers participated in "blitz builds" of Habitat for Humanity homes in June 2003, in LaGrange, Ga. Representatives of Habitat for Humanity International and the U.N. Human Settlements Program signed an agreement last week to combine their efforts to improve housing for the poor and reconstruction after disasters.

Agence France-Presse/Getty Images





ABSTRACT BOOK

**2-jo PSO tarptautinio
sveikatos ir būsto simpoziumo
santraukos**



WHO – Regional Office for Europe
European Centre for Environment and
Health (Bonn Office)

**September 29 - October 1, 2004
Vilnius, Lithuania**

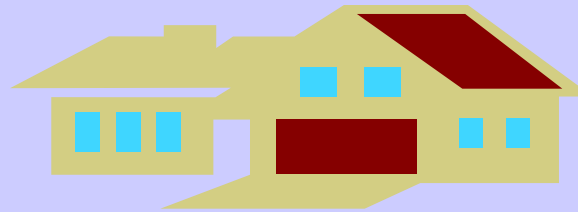
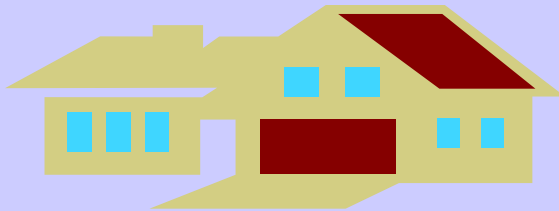
**Rugsėjo 29 - Spalio 1, 2004
Vilnius, Lietuva**

House

Physical Structure
Design Characteristics

Home

Social and Psychological
Characteristics

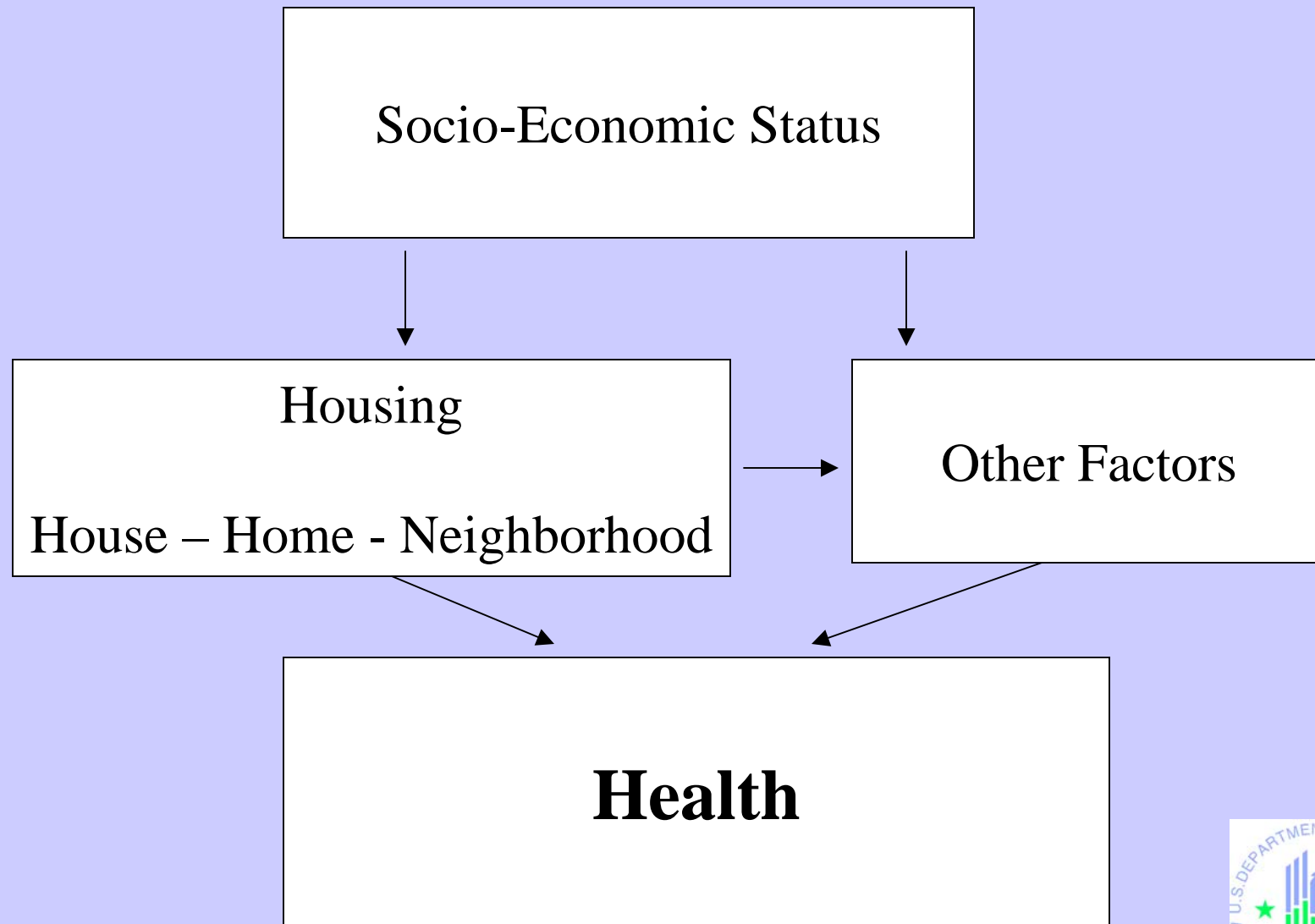


Neighborhood

Physical Area Around House
Local Services
Social Characteristics

Canadian Population Health Initiative





Key Determinants of Health

- Income and Social Status
- Social Support Network
- Education
- Employment
- Social Environments
- Physical Environments
- Personal Health Practices and Coping Skills
- Healthy Child Development
- Biology and Genetic Endowment
- Health Services
- Gender
- Culture



Affordable Housing Crisis

- In the US, half of the lowest-income households spend 50% or more of their incomes on housing
- The bottom 13 percent spend more than 50 percent
- 2.5-3.5 million people are homeless at some point in a given year
- Nearly 2 million households live in severely inadequate units.

Joint Center for Housing Studies, Harvard University, The State of the Nation's Housing, 2004

Homeless Children In New York City

- 61% not immunized (compared to 23%)
- 38% have asthma (compared to 10%)
- 50% greater risk of ear infections

Redlener and Johnson, 1999

Children Take in More Air, Water and Food Per Pound Than Adults

2 times resting air intake

3 times skin absorption

3 - 4 times food intake

3 times water intake



Bearer, CF. *Future Child* 1995;5(2):11-26





ASPINALL'S ENAMEL

SURPASSES ALL OTHERS.
AVOID IMITATIONS.



THE FINEST COLORS
IN THE WORLD

1837



Is NOT MADE
WITH LEAD AND IS
NON POISONOUS



COLOURS
PERFECT

SIXTY YEARS
EVOLUTION
IN DECORATIVE
ART

1897

PARIS. 24 RUE ALIBERT NEW CROSS LONDON. S.E. NEW YORK. 98/100 BERKMAN.





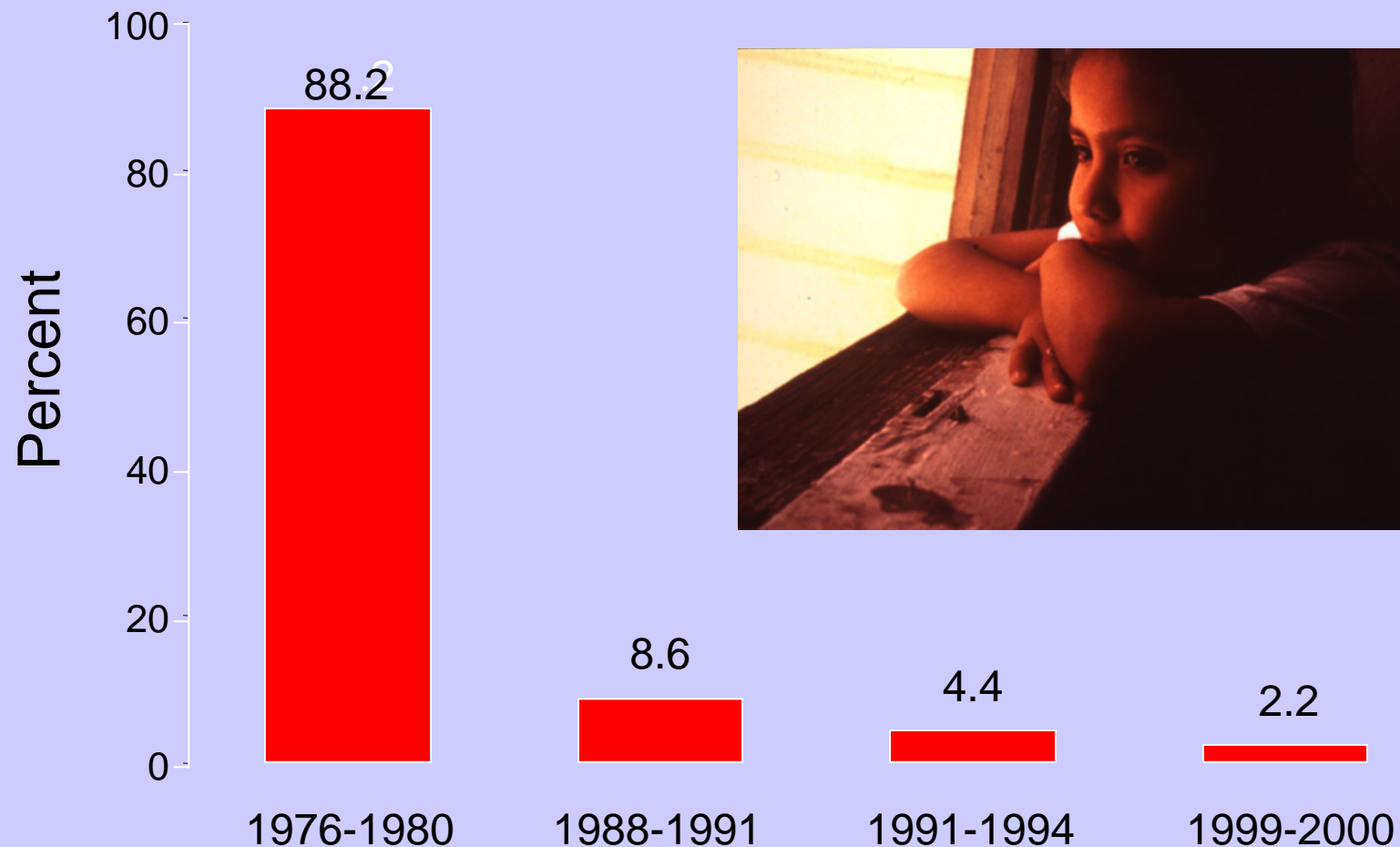
Paint chips poison Millie

President Bush said Thursday that his popular dog, Millie, is sick with lead poisoning after eating flecks of old paint during remodeling at the White House. It was not clear whether the dog's life is in danger.





Percent of children 1-5 years of age in the United States with blood lead levels $\geq 10 \mu\text{g/dL}$



Number of Lead Poisoned Children



- | | |
|---------------|-------------|
| • Late 1970's | 3-4 Million |
| • Late 1980's | 1.7 Million |
| • Mid 1990's | 890,000 |
| • 1999-2000 | 434,000 |

Source: Centers for Disease Control and Prevention





No. of Houses with Lead Paint

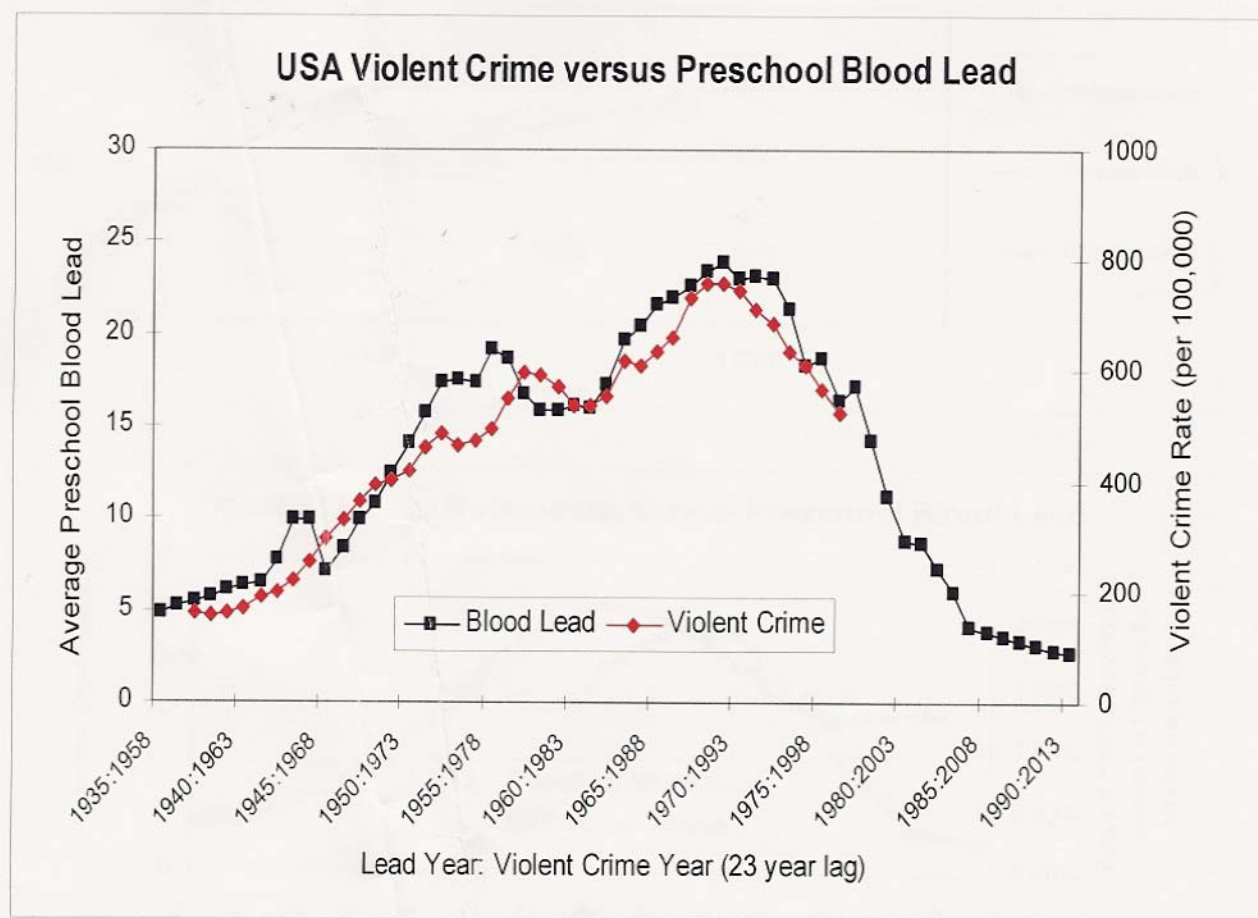
1990 – 64 Million

2000 – 38 Million



Source: Jacobs, et al. "Prevalence of Lead-Based Paint Hazards in Housing," Env Health Persp., 110: A599-606 (2002), HUD National Survey



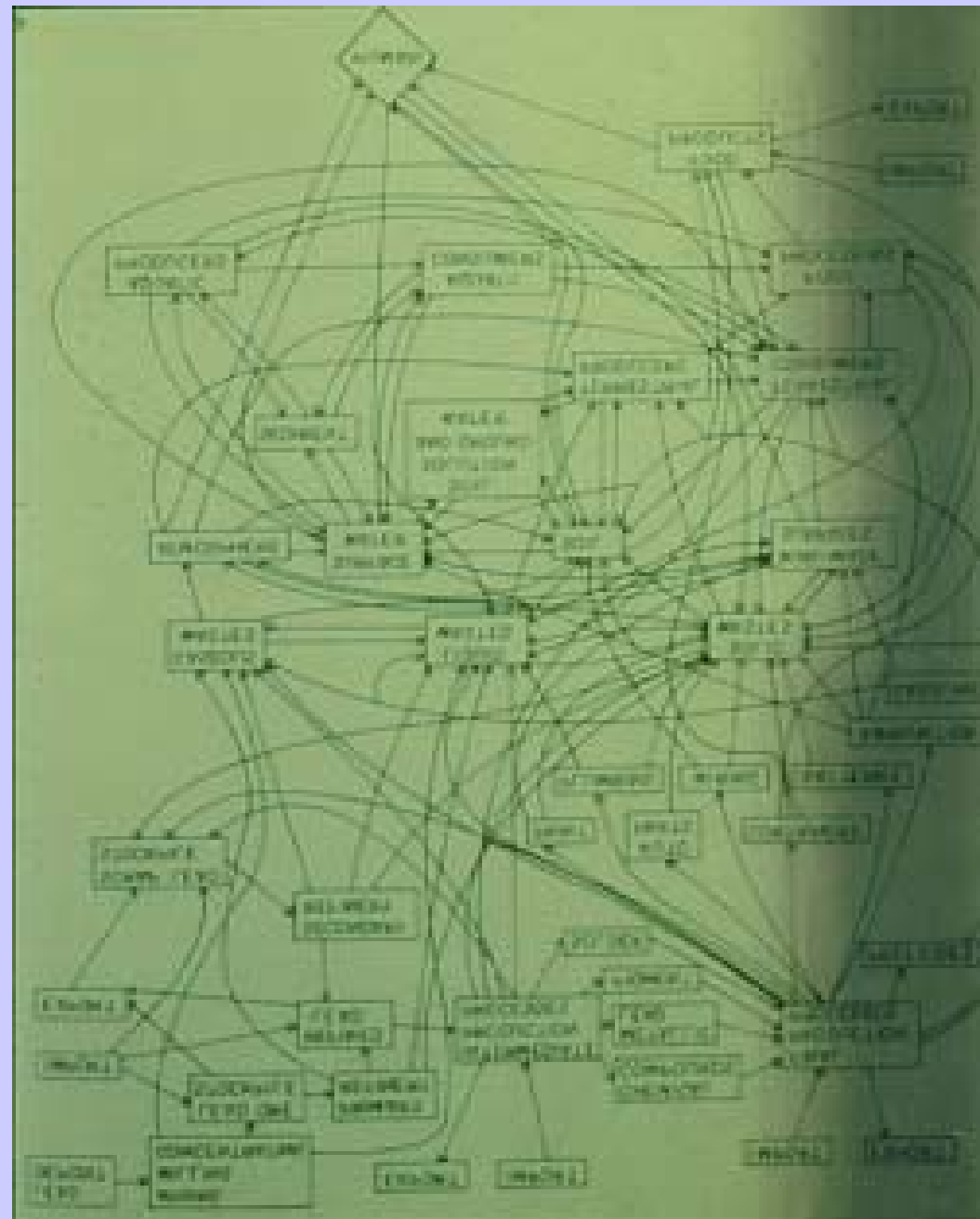


Exposure Assessment and Intervention – Late 1980s

- No health-based exposure standards for paint, dust or soil
- No standard inspection or abatement protocols
- No prohibited paint removal methods
- No lab QA/QC
- No performance criteria for paint XRFs

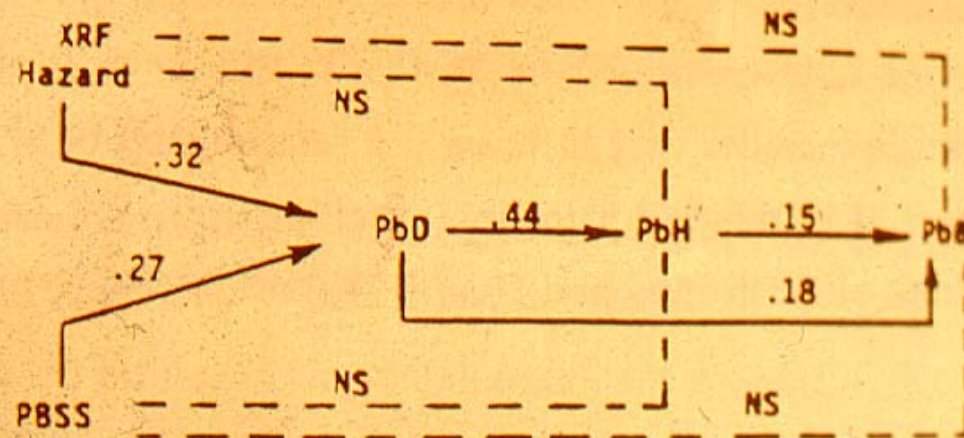
Late 1980s (cont'd)

- No trained or licensed inspectorate or abatement work force
- No occupational standards to protect workers
- No training curricula
- No concerted public education
- No laws regarding disclosure of known lead paint hazards
- No organized groups of parents of lead poisoned children
- No funding to address hazards in low-income privately owned high risk housing





Lead Exposure Pathways



Succop, P.A.; Krafft, K.M.; Clark, C.S.; Peace, B.; and Hammond, P.B. (1986), "Exterior Surface and Childhood Lead Exposure in an Urban Environment," in *Trace Substances in Environmental* by D.D. Hemphill (University of Missouri, Columbia).





DUST





Newsweek

July 15, 1991

LEAD And Your Kids

Disturbing New Evidence
About the Threat
to Their Health

How to Protect Them



Evaluation of the HUD Lead-Based Paint Hazard Control Grant Program

Final Report

Prepared for:
The U.S. Department of Housing and Urban Development
Office of Healthy Homes and Lead Hazard Control

By
The National Center for Healthy Housing and
The University of Cincinnati Department of Environmental Health

May 1, 2004



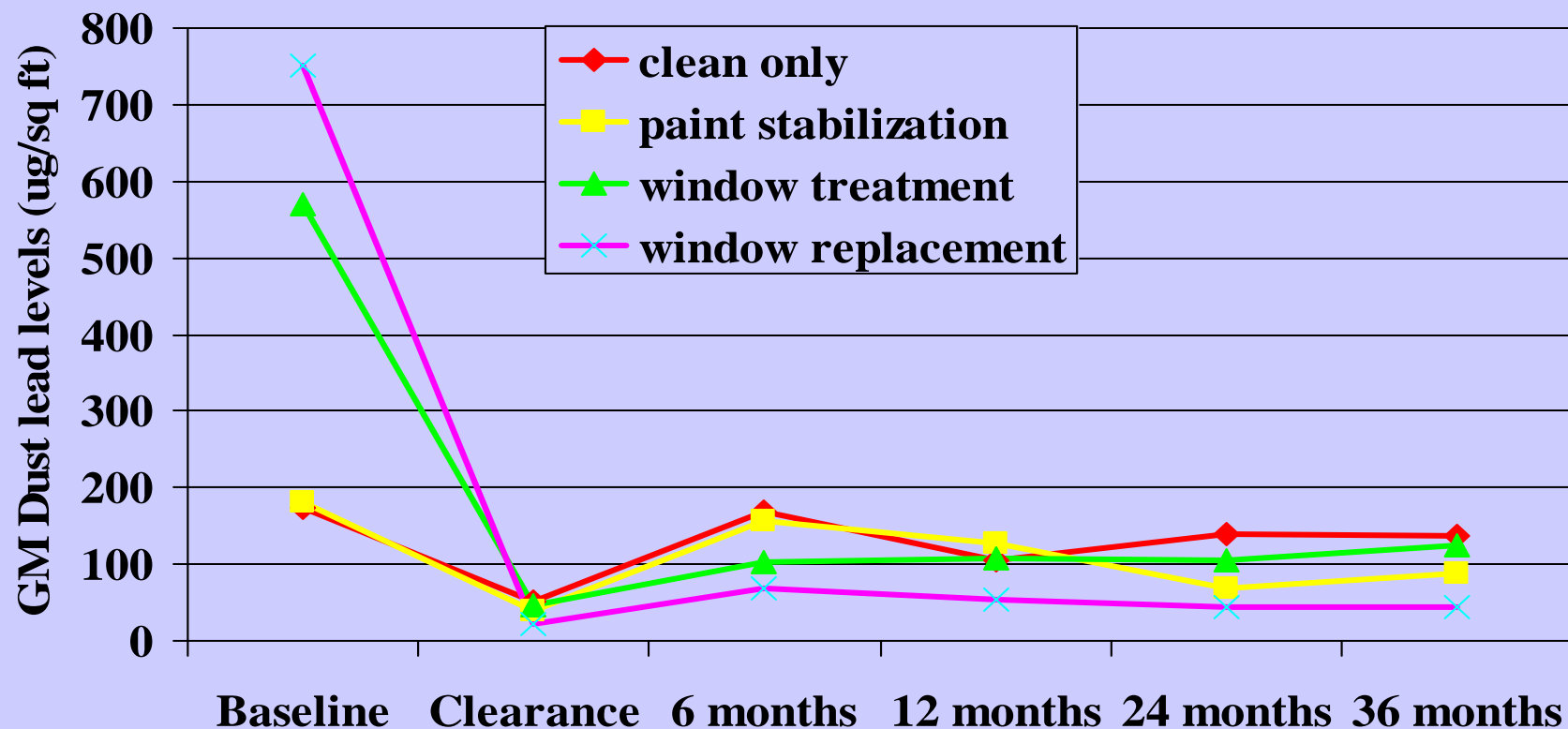
National Center for Healthy Housing



Results from HUD Lead Hazard Control Study

- Dust lead declined 78-95% (6 years)
- Blood lead declined 37% (2 years)
 - Mean PbB = 8.9 ug/dL

Relative Effectiveness of Intervention Strategy: Window Sills



Costs & Monetized Benefits

- Cost = \$230 million annually for 10 years = \$2.4 billion (unassisted low income housing)

Source: President's Task Force Report

- Monetized Benefits = 2.2 to 4.7 IQ point increase
→ increased lifetime worker productivity @
\$723,000 per child = \$110 to \$319 billion

(discounted 2000 dollars for each year's group of 3.8 million
two-year old children)

Source: Centers for Disease Control & Prevention





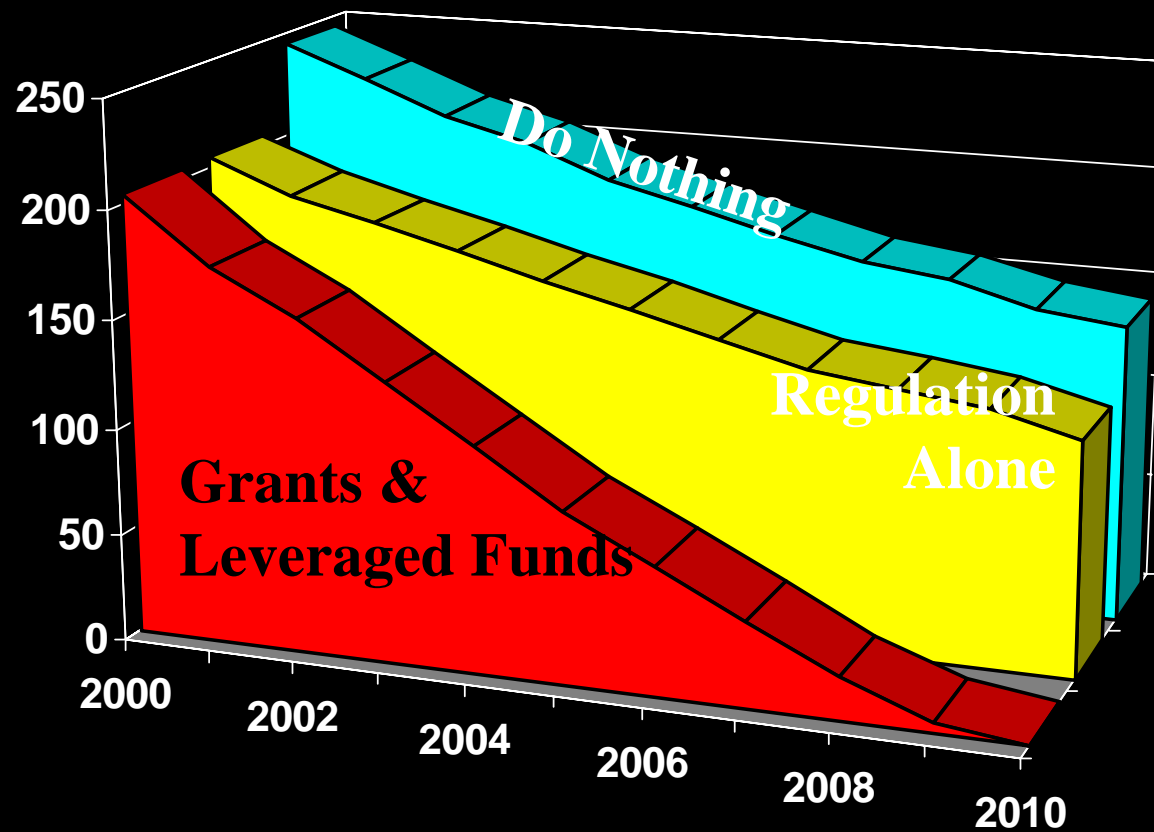






Defeating Lead Poisoning

Lead Poisoned Children
(thousands)



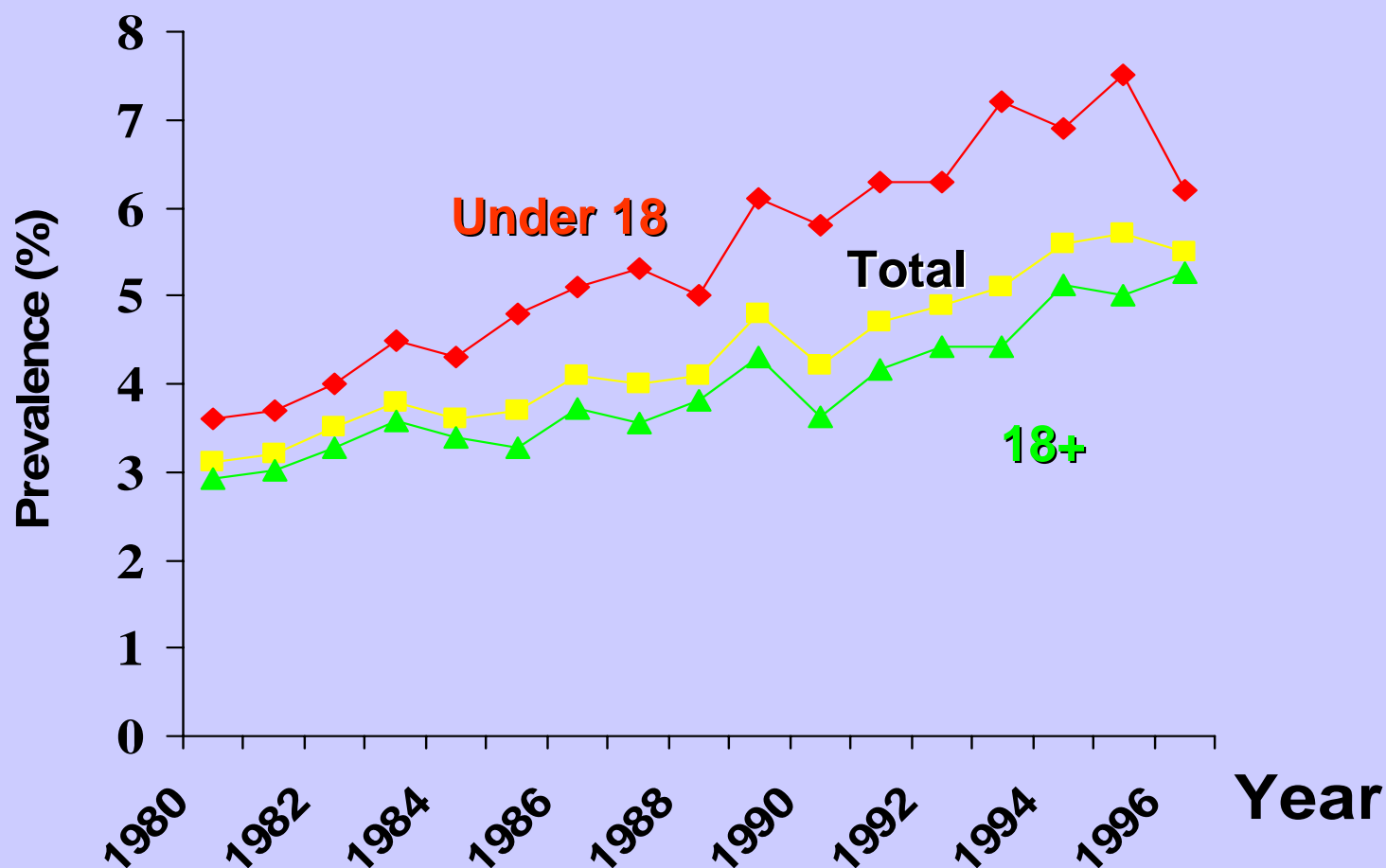
Applying The Lessons from the Lead Paint Experience





Asthma Prevalence* by Age

United States: 1980–1996



Source: National Health Interview Survey

* 12-month prevalence



The NEW ENGLAND JOURNAL *of* MEDICINE

ORIGINAL ARTICLE

Results of a Home-Based Environmental Intervention among Urban Children with Asthma

Wayne J. Morgan, M.D., C.M., Ellen F. Crain, M.D., Ph.D.,
Rebecca S. Gruchalla, M.D., Ph.D., George T. O'Connor, M.D.,
Meyer Kattan, M.D., C.M., Richard Evans III, M.D., M.P.H.,
James Stout, M.D., M.P.H., George Malindzak, Ph.D., Ernestine Smartt, R.N.,
Marshall Plaut, M.D., Michelle Walter, M.S., Benjamin Vaughn, M.S.,
and Herman Mitchell, Ph.D., for the Inner-City Asthma Study Group*



Inner City Asthma Study

- Randomized controlled trial in 7 US cities
- 937 children with atopic asthma (5-11 years old)
- Remediation of allergens and ETS
- Mattress & pillow covers
- HEPA Vacuum
- HEPA Air Purifier
- Pest Control
- Fewer symptom days for 2 years ($p < 0.001$)
- Significant reductions in dust mite and cockroach allergens for 2 years ($p < 0.001$)

Morgan et al., N Eng J Med 351;11, Sept 9, 2004



Unintentional Deaths for US Children
(Aged 0-19 years), 1985-1997
(excluding automobile accidents)

| Place | Percent |
|--|---------|
| Home | 55 |
| Recreation/Sports | 6.4 |
| Farm | 2.4 |
| Public Building | 1.9 |
| Street or Highway | 1.6 |
| Other | 32.7 |
| (Nagaraja et al. National Death Index) | |

Place of Injuries in US Children, 93-99

Hospital Emergency Room Visits/year

| Place | Total Injury Visits/yr |
|--|------------------------|
| Home | 4,010,000 |
| School | 811,000 |
| Public | 2,210,000 |
| Other | 841,000 |
| Unknown | 2,341,000 |
| Phalen et al. National Hospital Ambulatory Medical Care Survey | |

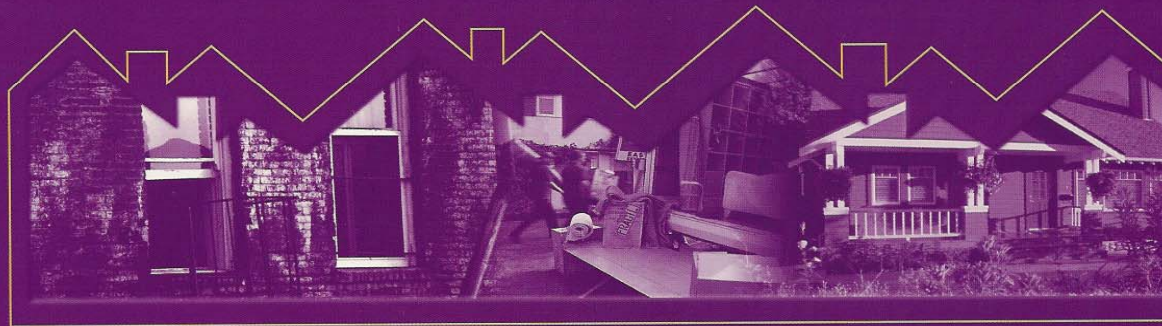




U.S. Department of Housing and Urban Development
Office of Policy Development and Research



Moving to
OPPORTUNITY *for*
Fair Housing Demonstration Program



Interim Impacts Evaluation



Moving to Opportunity and Tranquility: Neighborhood Effects on Adult Economic Self-Sufficiency and Health from a Randomized Housing Voucher Experiment

- Families living in high-poverty US public housing in 5 cities given vouchers to move to private housing in low-poverty areas (n=4,248 households)
- Significant improvements in obesity and mental health ($p < 0.05$)
 - Mental health measures included psychological distress, depression, worry, tense or anxious, sleep
- Significant improvement in asthma (one city only)
- Marginal improvement in hypertension
- No effect on employment, earnings, public assistance

Pesticides



Tools for Building Consensus



- 1. Research**
- 2. Guidelines**
- 3. Legislation and Regulation**
- 4. Education**
- 5. Grants**
- 6. Tax Policy**
- 7. Market-Based Approaches**
- 8. Enforcement**
- 9. Evaluation**





Landlord jailed, fined in lead-based paint warning case

ANY doubts over the federal government's seriousness about enforcing lead-based paint regulations could have dissolved with the recent criminal conviction of a Maryland landlord for brushing over the truth with the Department of Housing and Urban Development.

The 66-year-old landlord was sentenced to two years in prison and fined \$50,000 for obstructing a HUD investigation and making false statements to investigators. He lied to hide his failure to tell tenants about the lead-based paint in his low-income apartment buildings in suburban Washington.

It was the first criminal prosecution related to failure to give lead hazard warnings, which are required by the federal Lead Hazard Reduction Act of 1992, according to the Department of Justice, which brought the case in federal court in Greenbelt, Md.

As part of a plea agreement, the landlord has provided tenants with notices about lead paint assessments performed by an independent contractor, the Justice Department said in a news release posted on its Web site, www.usdoj.gov/.

The owner "admitted that he had notice of actual lead-paint hazards in one of his apartment buildings from District of Columbia lead inspectors, who informed him that they found lead in the building. However, (he) failed to disclose actual and potential lead hazards before leasing to tenants," the Justice Department said.

The landlord admitted trying to obstruct a HUD investigation "by backdating his signature, backdating tenant signatures and directing tenants to backdate forms by entering the date they moved into their apartments, rather than the date they were actually warned about health risks, which was after they had moved in," the Justice Department said. "In some cases, the tenant signatures were signed by ... resident property managers."

The Apartment Association of Central Okla-

**RICHARD
MIZE**



REAL ESTATE





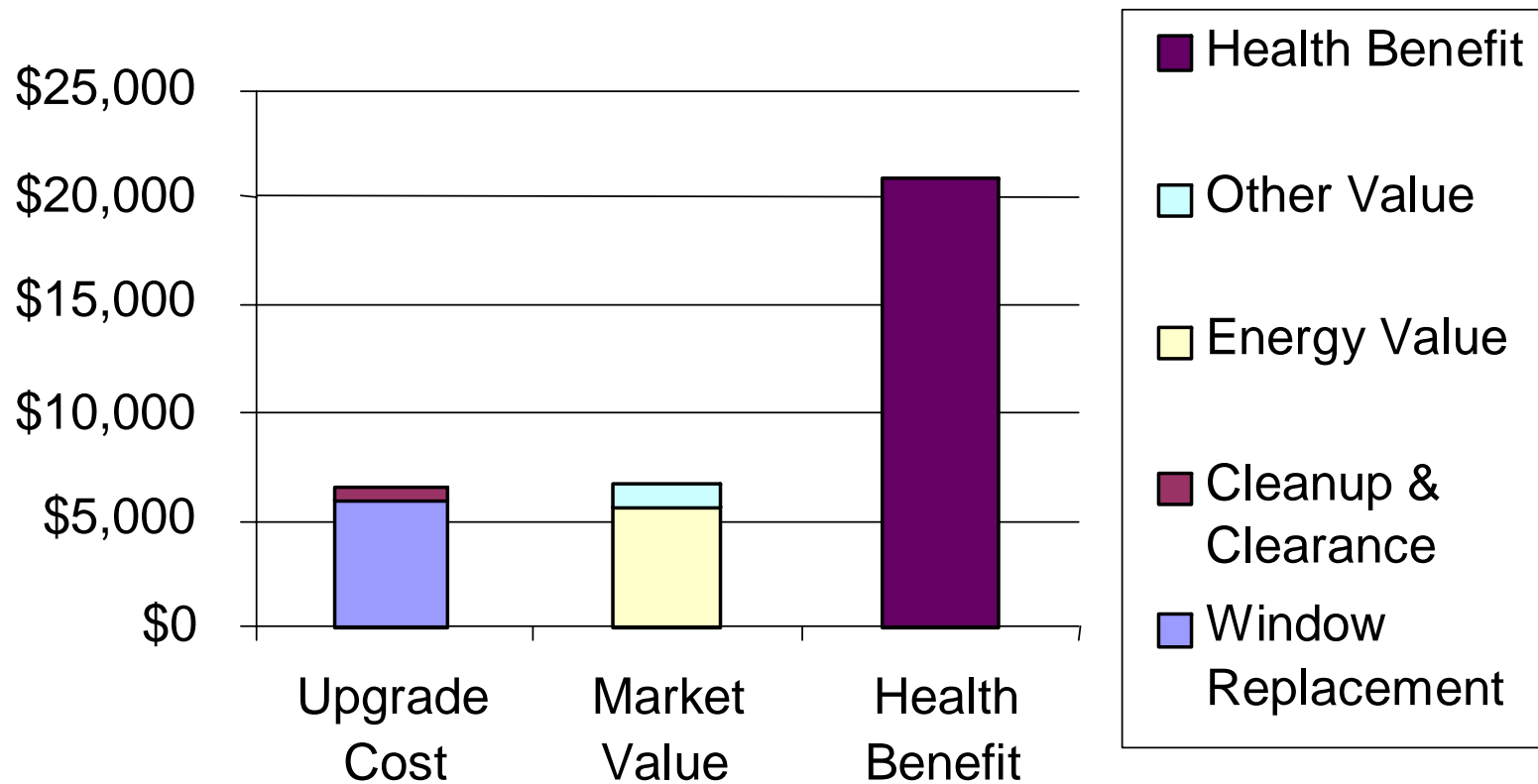
Benefits of Window Replacement

HUD Lead Paint Grant Program Evaluation Data: Lead Dust Accumulation

- Cost/Benefit Analysis of HUD Lead Paint Rule
- Energy Savings: Heating and Cooling
- Housing Value
- Asthma?
- Mold?

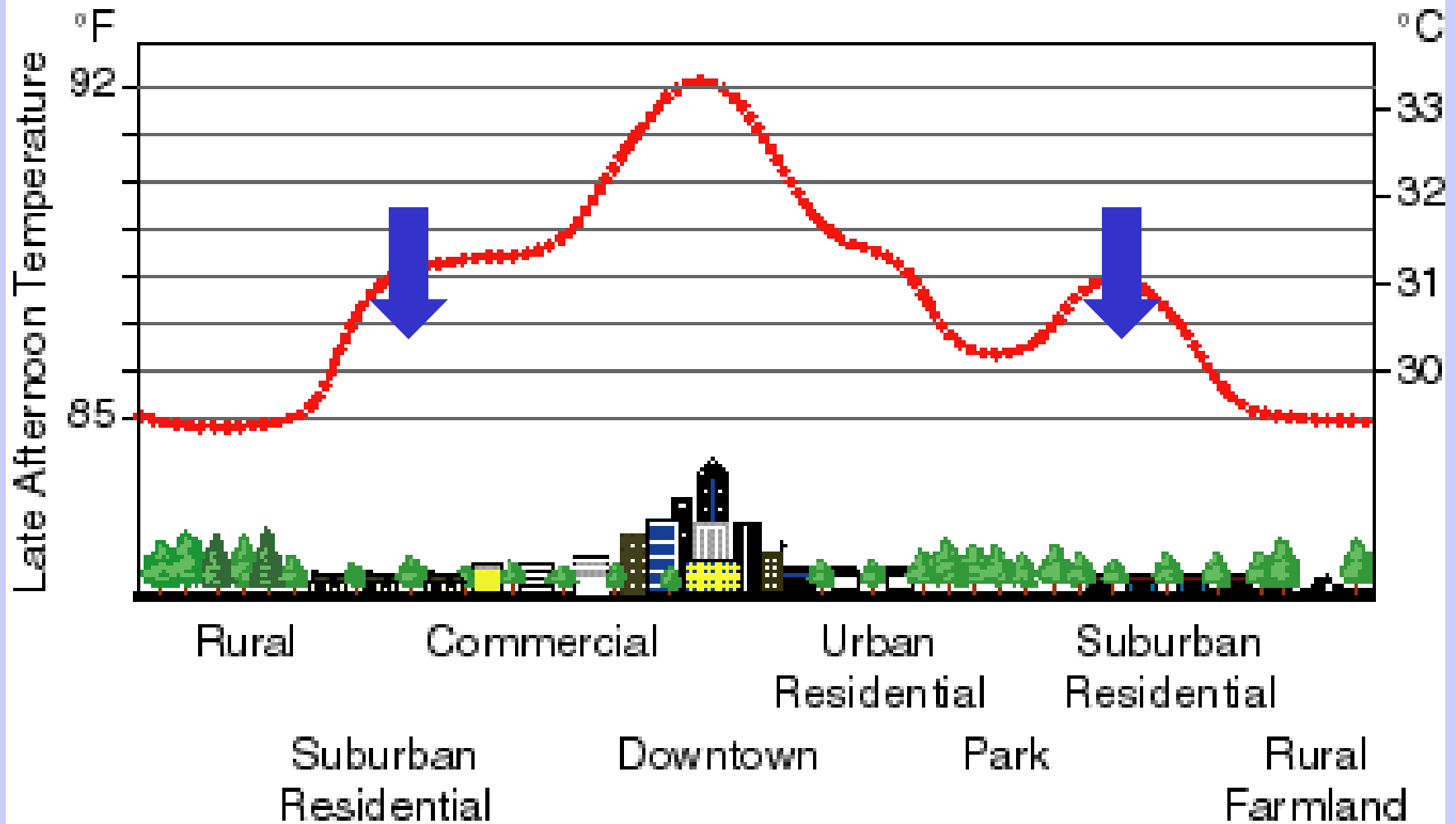


Window Replacement Costs and Benefits



The Heat Island

Sketch of an Urban Heat-Island Profile



Housing Market Price & Health: Unfinished Business

- Should a Healthy Home Cost More?
- Why are Healthy Homes Investments Unlike Other Home Improvements?
- Finding Market Vehicles to Provide Incentives to Promote Investment in Healthy Homes
- Cost of NOT Making Homes Healthy





Two Policy Development Processes

1. "The Science of Muddling Through"

- Lindblom

2. "Comprehensive Change"

- Quade

CE Lindblom, the Science of Muddling Through, Public Administration Review

E.S. Quade, Analysis for Public Decisions





Priority Hazards – Substance-By-Substance Approach

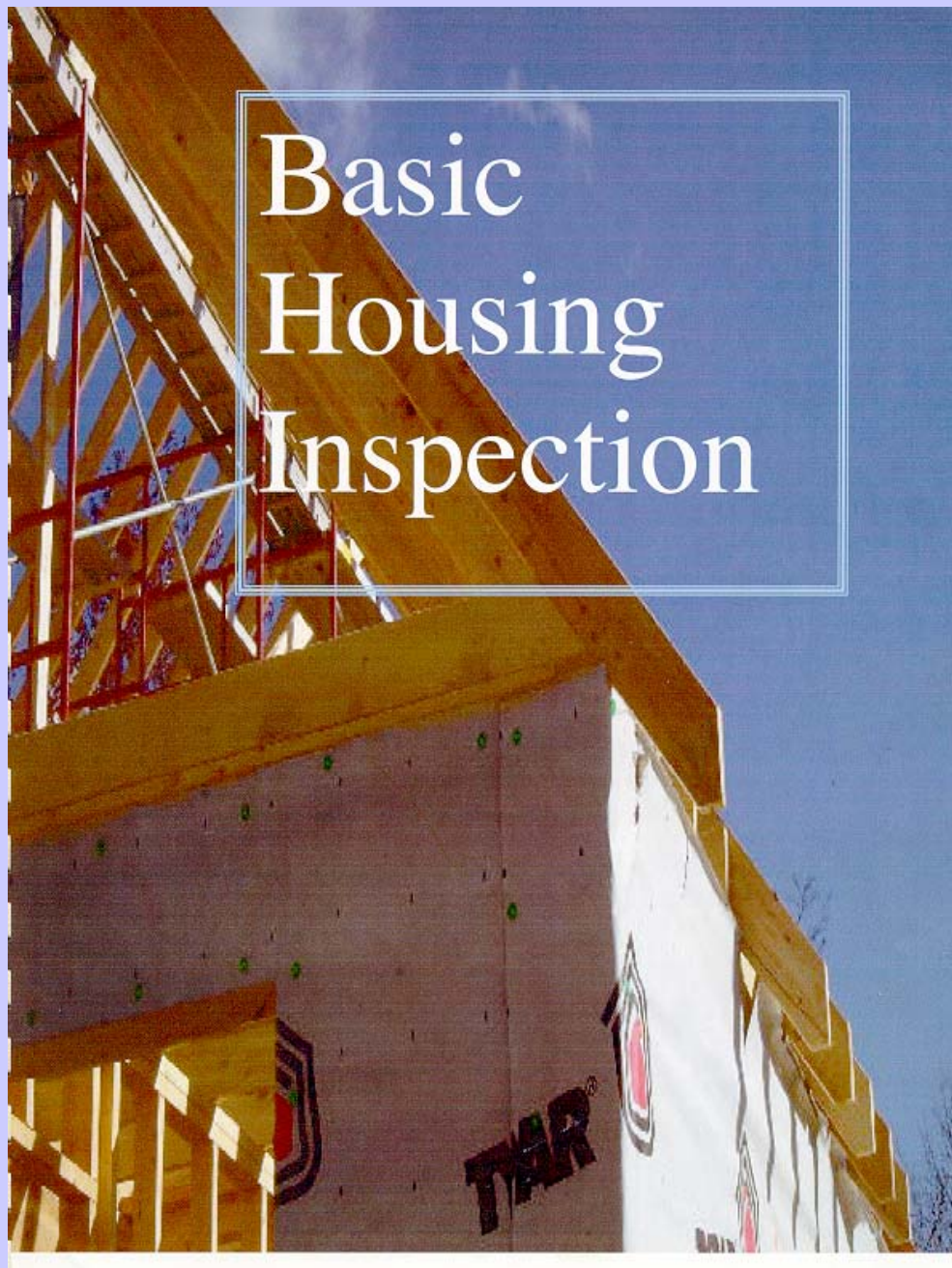
- **Allergens/asthma**
- **Asbestos**
- **Combustion products**
- **Lead**
- **Mold and Moisture**
- **Insects and Rodents**
- **Pesticides**
- **Radon**
- **“Take Home” Hazards & Work at Home**
- **Unintentional Injuries/ Fire**
- **Other**



Priority Hazards – Housing Systems Approach

- Moisture
- Settled Dust
- Ventilation
- Education

Basic Housing Inspection



Help Yourself to a
Healthy Home
Protect Your Children's Health



U.S. Department
of Housing and
Urban Development,
Mel Martinez, Secretary

- Indoor Air Quality
- Asthma & Allergies
- Mold & Moisture

- Carbon Monoxide
- Lead
- Drinking Water

- Hazardous Household Products
- Pesticides
- Home Safety



Key Research & Policy Needs

- Housing hazard measurement techniques
- Interactions between specific housing conditions and physical and mental health
- Interactions with confounding variables
- Long-term assessment of the efficacy of integrated housing- and community-based interventions, instead of categorical
- Identification of better ways to translate research findings into policy
- Rebuilding bridges between housing & health



Research on lead hazards is solution, not problem

Children don't live in lead-burdened houses because researchers want to "experiment" on them but because so much housing is contaminated by lead.

By DON RYAN

WASHINGTON — The Maryland Court of Appeals' harsh criticism of the Kennedy Krieger Institute's lead poisoning research has created the impression that researchers sacrificed children's health for the good of science.

The outrage expressed in news reports is rooted in the false premise that this study placed children in harm's way. The reality is that this research made homes safer, not only for the children in Baltimore but for hundreds of thousands of others across the nation.

Children do not live in lead-burdened houses because researchers want to "experiment" on them but because so much of our housing is contaminated by lead. According to the most recent national survey, 40 percent of all U.S. housing contains some lead-based paint.

The only way to prevent lead poisoning is to make properties safe from lead hazards before a child is poisoned. The only way to accomplish this is to figure out "what works."

Ironically, Dr. Julian Chisholm and Dr. Mark Farfel, the very researchers now being vilified, directed the pioneering study that proved traditional, haphazard abatement methods actually increase children's lead exposure.

As a result, conventional dusty paint removal methods, which were commonly required in the past, since have been banned by local, state and federal agencies. By highlighting the danger of lead dust and validating affordable measures for protecting children on a broad scale, their research helped shift the national approach to prevention and laid the foundation for science-based national standards.

Just as important, the greater good from the Chisholm/Farfel research did not come at the expense of families in Baltimore.



ARTICLE IN PRESS



NEUROTOXICOLOGY

AND

TERATOLOGY

Neurotoxicology and Teratology 5507 (2002) 1–3

www.elsevier.com/locate/neutera

Commentary

Confronting the ethical challenges of environmental health research

Don Ryan^{a,*}, Nick Farr^{b,1}

^a*Alliance To End Childhood Lead Poisoning, 227 Massachusetts Avenue, Northeast, Suite 200, Washington, DC 20002, USA*

^b*National Center for Healthy Housing, 10227 Wincopin Circle, Suite 205, Columbia, MD 21044, USA*

Received 22 March 2002; accepted 4 April 2002



“Until effective standards for the domestic environment are devised, it is likely that children will continue to be employed as biological indicators of substandard housing.”

Donald Barltrop, 1974



*The health of the child
is the power of the nation*



APRIL 1918

Children's Year

APRIL 1919

UNITED STATES CHILDREN'S BUREAU AND WOMAN'S COMMITTEE OF THE COUNCIL OF NATIONAL DEFENSE